

JIG DESIGN

ing action, and the rocker jaw has sufficient "float" to take care of variations in the casting.

Piston Chuck having Floating Clamping Features. — The work *A*, shown in Fig. 8, is a large automobile piston which has been bored and faced on the open end to a predetermined size and which is to be completed in this setting, concentric and square with the finished portion. Previous to this setting and after the boring and facing operation, the wrist-pin hole is rough-drilled in a jig in order to facilitate the holding of the work on the fixture.

The casting is located on a hardened and ground steel ring *F* which is forced on the body of the fixture 5, and a small annular groove on the ring prevents trouble or errors in locating, which might be caused by the presence of chips or dirt on the locating surface. The body of the fixture is held in place on the table of the machine by the bolts *C* which enter the table T-slots, and it is centered on the table by the plug *D* which is forced into it at *S*. The clamping pin *L* is ball-ended, and has a spherical portion in the center also. It is slotted at *N* so that the pin *M* in the draw-bar *G* will enter the slot as it is passed through the wrist-pin holes, and bring up against the shoulder so as to center the clamping pin in the piston. A great deal of strain is taken by this clamping pin, and for this reason it is made of tool steel and spring tempered, so that there will be less chance of breakage.

The draw-bar *G* is also of tool steel, and it is keyed with a Woodruff key at *II* to prevent its turning, the key being a sliding fit in the body of the fixture. The lower end of the rod is threaded with a 4-pitch Acme thread, double, left-hand, to fit the operating nut *Q*, this latter being provided with a handle *R* which extends out through a cored opening *O* in the fixture. The permissible movement of this handle is sufficient to produce a vertical movement of $\frac{1}{8}$ inch of the drawbar, which is ample for the purpose of clamping and releasing. A thrust collar *P* is interposed between the* operating nut and the boss on the under side of the fixture, and a coil spring / keeps the rod up so that the clamping pin may be easily placed